

Adult female. Characters as in male except as follows: mid-dorsal light stripe of abdomen full-length, or almost so, on segments 1-7; whitish lateral markings of abdomen a little more extensive, the basal spot of 3-7 being continued beyond the darkened transverse carina of each segment as a broad light stripe, almost full-length; segment 9 broadly and conspicuously yellow on the lateral margins, 8 less so. The relative lengths of abdominal segments 7, 8, 9, 10, and appendages are about as 20:17:18:10:5.

Venation in both sexes. Of 56 wings examined, 14 had only two crossveins under the stigma, although sometimes a third was at the distal end of the stigma. One front wing had three full-width cells in the trigonal interspace, but all other wings had none. The nodal crossveins in all specimens counted were as follows: forewing antenodals 9(2), 10(3), 11(13), 12(3), 13(1), postnodals 6(7), 7(8), 8(4), 9(3); hind wing antenodals 5(1), 6(1), 7(1), 8(19), postnodals 6(11), 7(10), 9(1).

Measurements. Total length including appendages, ♂ 39-43, ♀ 41-41.5; abdomen, ♂ 29-32, ♀ 30-30.5; hind wing, ♂ 20-21, ♀ 22.5-23 mm.

Specimens examined (11 ♂♂, 3 ♀♀). NORTH CAROLINA: Aberdeen, 1 ♂, April 14, 1922, collected by C. S. Brimley; Southern Pines, 1 ♂, May 9, 1964, collected by R. Duncan Cuyler. SOUTH CAROLINA: Campbell's Lake State Park, south of Cheraw on U. S. highway 1, 1 ♀, April 9, 1965, collected by Dennis R. Paulson, 1 ♂, April 16, 1965, collected by M. J. Westfall, Jr.; Cheraw State Park, south of Cheraw, on U. S. highway 1, 7 ♂♂, 1 ♀, April 17, 1965, collected by Carol, Holly, and M. J. Westfall, Jr., tandem pair, April 18, 1965, collected by M. J. Westfall, Jr. The Aberdeen specimen is in the University of Michigan collections, and all others are in the University of Florida collections.

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FLORIDA FRESH WATER FISHES AND CONSERVATION

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A GENERALLY accepted definition of conservation is "the wise utilization of natural resources for the greatest good to the greatest number." As far as fish are concerned this concept comprises many aspects such as fishery management and various others of a more or less practical nature. In other words conservation is an applied science mostly based, at present, on pure research not originally intended for conservation purposes. It is true that the rapidly advancing field of fish conservation has developed its own lines of research, but much previous work not originally intended for conservation purposes has been ignored or overlooked especially in matters pertaining to legislation.

Legislation is an important aspect of fish conservation. It provides the necessary controls and restrictions. But unless these restrictions are justified by reasonable scientific evidence their purpose may be defeated.

In Florida a good example of this has been taking place for a number of years, in regard to the size-limit of the fishes collectively known as "snook," although four distinct species of snook occur (Rivas, 1962). According to present regulations any snook taken in Florida has to be released unless it is 18 inches in total length or larger. This regulation is based on the misconception that there is only one species of snook in the state, *Centropomus undecimalis*, which may reach 60 inches. It is known that most individuals of this species are immature at a length of less than 18 inches therefore the regulation is justified for this species but certainly not for the other three. The fat snook (*C. parallelus*) rarely grows to a length of slightly more than 18 inches, and much smaller individuals are fully mature. The tarpon snook (*C. pectinatus*) is not known to reach a length of more than 16 inches, and the sword-spined snook (*C. ensiferus*) is probably ready to die of old age at a length of 12 inches. According to this regulation, therefore, an angler can very seldom keep a specimen of fat snook and probably never a specimen of tarpon snook or sword-spined snook. This unsound type of conservation is particularly distressing since the presence of four species of snook in Florida has been known for 16 years (Rivas, 1949).

The above discussion leads us to the importance of education of the general public in matters of conservation, since it may be argued that most anglers cannot tell apart the different species of snook. Actually they are easier to recognize than the various species of bass, which are easily identified by most anglers.

One of the most important problems in Florida fish conservation today is the accidental, and in some cases not so accidental, introduction of exotic species. The problem of the South American piranha has been recently discussed by Martin A. Moe, Jr. (1964) and proper restrictions on this fish are now in effect. The accidental introduction and establishment in South Florida of *Belonesox belizanus* from Yucatan has been studied at the University of Miami. James P. Clugston of the Game and Fresh Water Fish Commission and myself are now surveying the various exotic fishes introduced in Florida. Among others the oscar (*Astronotus ocellatus*), a South American cichlid fish, is now well established in drainage canals between Miami and Homestead. Another South American cichlid, the black acara (*Aequidens portalegrensis*) is established in Fort Lauderdale. The jewelfish (*Hemichromis bimaculatus*), a cichlid fish from Africa, occurs in the Hialeah Canal, and two Central American cichlids, the firemouth (*Cichlasoma meeki*) and the congo (*C. nigrofasciatum*) are said to have become established in a rock pit in northwest Miami. Three years ago I identified a South American mailed catfish (*Hypostomus plecostomus*) from a rock pit in West Miami.

J. Edward Burgess (1958), of the Game and Fresh Water Fish Commission, has discussed the presence of exotic fishes in Six Mile Creek, Hillsborough County. Two cichlids, one *Gourami*, and one South American catfish were found to occur in the area.

Another very pressing problem in fish conservation is the wholesale killing of fishes by sewage and chemical pollution, especially the toxic effect of pesticides. The chinch bug insecticide Parathion has been recently outlawed in Dade County because of its lethal effect on the aquatic life through runoff and underground seepage. At present the University of Miami Department of Pharmacology is studying pesticides that would not be lethal to aquatic organisms.

The gradual silting of lakes and other bodies of fresh water, through mismanaged agricultural activities, may spell the end of their aquatic life. A good example of this is Lake Trafford in Collier County. Until a few years ago this, the southernmost natural